EXERCISE 1-1 Multiple Choice Questions (MCQs)

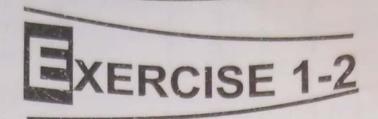
Q.1	Four options are given in each choice which you think is correctorice. Use marker or pen to two or more circles is not allow which of the following is a pro-	fill the circle ved: position?	es. C	utting	or fill	the hat ing
(i)	(a) What is your age (c) Do not irritate him	(d) Quetta i	s a c	ity of	Pakist	
Sol:	(a), (b) and (c) are not propositive nor false. (d) is a proposition and its truth v	alue is true (T).		re neit	ther
	Correct answer is option (d). Which of the following is not a	a) nronosition	(b)	(C)		
(ii)	(a) $7 > 9$ (b) $2 + 3 = 5$	(c) x < 5		(d) 2 +	2 - 5	
	(a) 1 - 3 (b) = - 3	(a)	(b)	(a) 2 ·	(d)	
Sol:	(c) is not a proposition, because					
	Correct answer is option (c).	a	(D)		(1)	
(iii)	Which of the following is a pro					
	(a) Do not smoke	(b) $x + y = x$				
	(c) Lahore is capital of Punjab	(a) waik aid	ong t (b)	ne roa	ad ad	
Sol:	(c) is a proposition and its truth		T)	0	0	
	Correct answer is option (c).	(a)	(D)		a	
(iv)	The negation of "Today is Frica) (a) Today is Saturday (c) Today is Thursday	(b) Today i (d) None of	the	se	У	
		(a)	(P)	©	@	

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Sol:	The negation of "Today is Friday	" is "Today is not Friday
	Correct answer is option (b).	(a) (b)
(v)	If $p: x + y = 3$, then $\neg p$ is	0
	(a) $x + y \neq 3$ (b) $x + y > 3$	(c) $x + y < 3$ (d) $x + y = 0$
	- 0" :- "·	(a) (b) (c) (d)
Sol:	The negation of " $x + y = 3$ " is " x "	
(vi)	Correct answer is option (a).	columns that specific
(**)	An arrangement of rows and value of a compound proposi of its constituent propositions	tion for all possible trust
	of its constituent propositions	
	(a) Truth Table	(b) Venn diagram
	(c) False Table	(d) None of these
0-1-	0	0000
Sol:	Contrapositive of given state	ment "If it is raining i
(vii)	an umbrella" is	ment in it is raining, I will tal
	(a) I will not take an umbrella i	f it is not raining
	(b) I will take an umbrella if it i	
	(c) It is not raining or I will tak	e an umbrella
	(d) None of these	
Sol:	Correct answer is option (a).	0 0 0
(viii)	p \(q \) is true if	(b) q is false
	(a) p is false (c) both p and q are false	(d) both p and q are true
	(0) 2011 p una q aro raiso	(a) (b) (c) (d)
Sol:	$p \wedge q$ is true if both p and q are t	rue
	Correct answer is option (d).	② ⑤ ⑥
(ix)	p V q is false if	
	(a) p is false	(b) q is false
	(c) both p and q are false	(d) both p and q are true (a) (b) (c) (d)
Sol:	$p \vee q$ is false if both p and q are	0 0
	Correct answer is option (c).	a b 0
(x)	$p \oplus q$ is true if	
	(a) p is false	(b) q is false and p is true
	(c) both p and q are false	(d) both p and g are true
0-1-		
Sol:	$p \oplus q$ is the proposition that is t	rue when exactly one of p
	Correct anguer is entire (h)	
(xi)	Correct answer is option (b). If $p: 2^2 > 1^2$; $q:$ every odd nun	a) a ber is divisible by 2, then
()	(a) p v q is false	(b) p v q is true
	(c) p \ q is true	/-II - Maie false
		(a) p + 4 is labe © (b)
Sol:	Here p is true and q is false, so	p v q is true.

	and Applications					~
Chapte	Logic and Applications 1: Logic and Applications 1: Logic and Applications	(a)	•	© (0	
	Correct a = 5 : q : every even in	umber is	divisib	le by 2	then	
		$(d) p \oplus q$	is true			
	10 0 1 9 13	a	(b)		@	
	Here both p and q are true, so p .	م q is true	6	•	a	
Sol:	correct answer to the state of E	akietan:	1	27.01		
(xiii)	. No evell integer	sible by	2, ther	whic	h of t	he
	following is true:					
	(a) $p \wedge q$ (b) $p \oplus q$	(c) p (a	0 0	(C)	@	
eal.	Here p is true and q is false.	(8)		0	@	
Sol:	Correct answer is option (b). If p: no lion eats meat; q: 1 +	1 = 2, the	n	0	•	
(xiv)	(a) $p \rightarrow q$ is false	$(a) b \rightarrow (a)$	q is tru			
	(c) p ⊕ ¬q is true	(d) ¬p ^	q false	e ©	a	
0.1.	Here p is false and q is true.					
Sol:	Correct answer is option (b).	(3	0	0	
(xv)	The converse of $p \rightarrow q$ is	(b) -n	. — «	H. ger		
	(a) $q \rightarrow p$	(b) $\neg p$				
	$(c) \neg q \rightarrow \neg p$	(d) <i>p</i> ↔	a b	© (C	0	
Sol:	Correct answer is option (a).		• 6) ©	0	
(xvi)	The inverse of $p \rightarrow q$ is	(b)	\a			
	(c) $\neg d \rightarrow \neg b$	(b) ¬p				
	(1) 47 P	(d) <i>p</i> ↔	(a) (b)	(C)	0	
Sol:	Correct answer is option (b).		a	0	0	
(xvii)	The contrapositive of $p \rightarrow q$ is	S				
	(a) $q \rightarrow p$ (c) $\neg q \rightarrow \neg p$	(b) ¬p	$\rightarrow \neg q$			
	The state of the s	/ 11				

Sol: Correct answer is option (c).

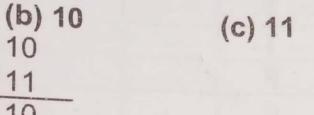
(b) (c) (d)

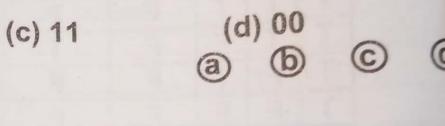


Q.1	- Al-
w. 1	Four options, the
	Four options are given in each of the following questions, the choice which are given in each of the following questions, the
	Willest Voll things
	two or more similar or pen to fill the circles. Cutting or filling
	two or more circles is not allowed:
(i)	do more circles is not allowed.

 $10 \land 11 =$ (a) 01

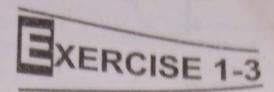
Sol:





Correct answer is option (b). (ii) 10 V 11 =

-	r-1: Logic and	Applications		1	Exerc	ise 1-2	23
Chapte	JAI. EUG	10					
Sol:		11					
_		11					
	a-most answ	er is option (c).		(a	(1)		0
	10 ⊕ 11 =						
(iii)	(a) 01	(b) 10	(c) 11		(d) 00		
- 1	(a) 01	10		(a	(b)	0	@
Sol:	0	11					
		01					
	Correct answ	er is option (a).			6	0	0
(iv)	1011 A 0110	=					
(14)	(a) 0010	(b) 1111	(c) 1101		(d) 100	1	
Sol:		1011		a	(b)	©.	@
	Λ.	0110					
		0010					
		ver is option (a).		•	b	0	0
(v)	1011 V 0110						
	(a) 0010	(b) 1111	(c) 1101		(d) 100	1	
Sol:		1011		(3	(b)	0	(0)
		0110					
	0	1111					
(:\		ver is option (b).		(3		0	a
(vi)	1011 ⊕ 011		() () ()				
Sol	(a) 0010	(b) 1111	(c) 1101		(d) 100	11	
Sol:		1011		(3	(a) (b)	0	@
		0110					
	Correct and	1101					1
(vii)	Let us cons	wer is option (c).		(a b	0	0
, ,	Det us consider propositions p: He works hard q: He gets first position						
		ation of $p \land \neg q$	q . ne gets	TIPST	position	1	
	(a) If he wou	rks hard than h	IS:				
	(b) If he get	rks hard, then he	e gets first	positi	on.		
	(c) He work	s first position,	tnen ne wo	rks ha	ard.		
	(d) He gets	s hard but he do	bes not get	first p	osition	١.	
0.		first position bu	it does not		-	_	
Sol:	PA-a: He	Works hard had h		(a) (b)	0	@
hiten	Correct ansi	works hard but hwer is option (c).	ne does not	get fir	st positi	on.	
(viii)	Let	wei is option (c).			a b		0
	p: He com	pletes BS in 5 ye					
			ears.				
	men a -						
	MI De commission						
1000	(b) If he get	s ich then ha	years, then	he g	ets job.		
	(c) He com	is job, then he c pletes BS in 5 vo	ompletes B	so in s	years.		



Multiple Choice Questions (MCQs)

- Q.1 Four options are given in each of the following questions, the choice which we given in each of the following questions, the choice which you think is correct; fill the circle in front of that choice. Use many choice. Use marker or pen to fill the circles. Cutting or filling two or more circles is not allowed:
- (i) PATE

(a) p

(b) ¬p

(c) T

(d) F

Sol: Identity law states that $p \wedge T \equiv p$ Correct answer is option (a).

(1)

(ii) PVF≡ (a) p

(b) -p

(c) T

(d) F (D)

Sol: Identity law states that $p \vee F \equiv p$ Correct answer is option (a).

(b)

(iii) PVT= (a) p

(b) ¬p

(c) T

(d) F (b)

Sol: Domination law states that $p \vee T = T$ Correct answer is option (c).

(b)

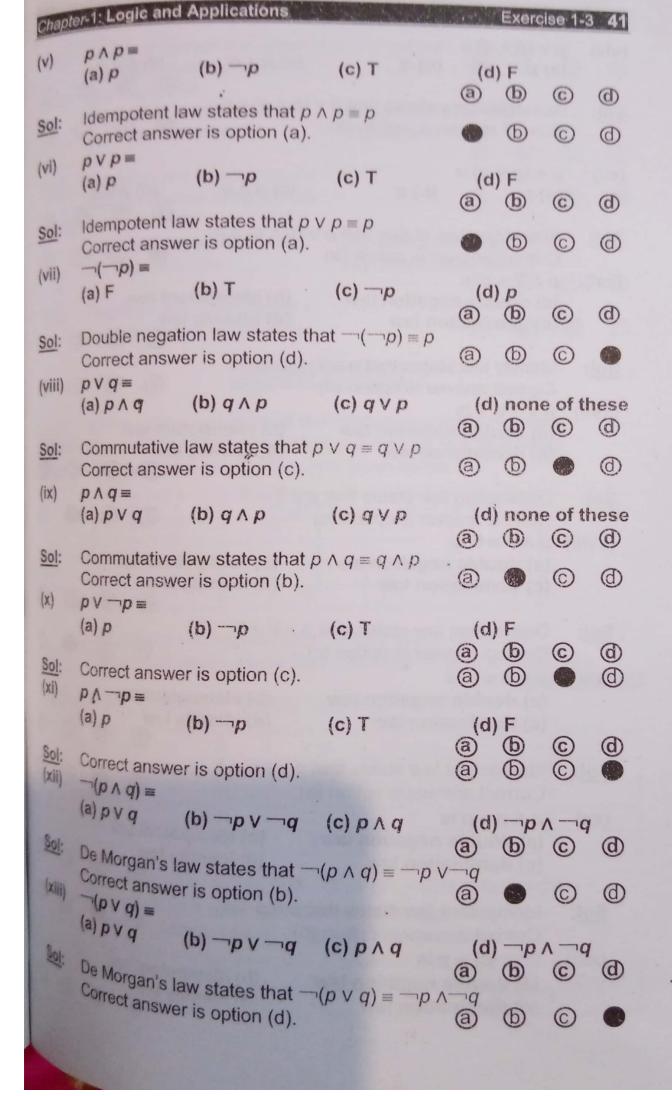
(iv) p ∧ F = (a) p

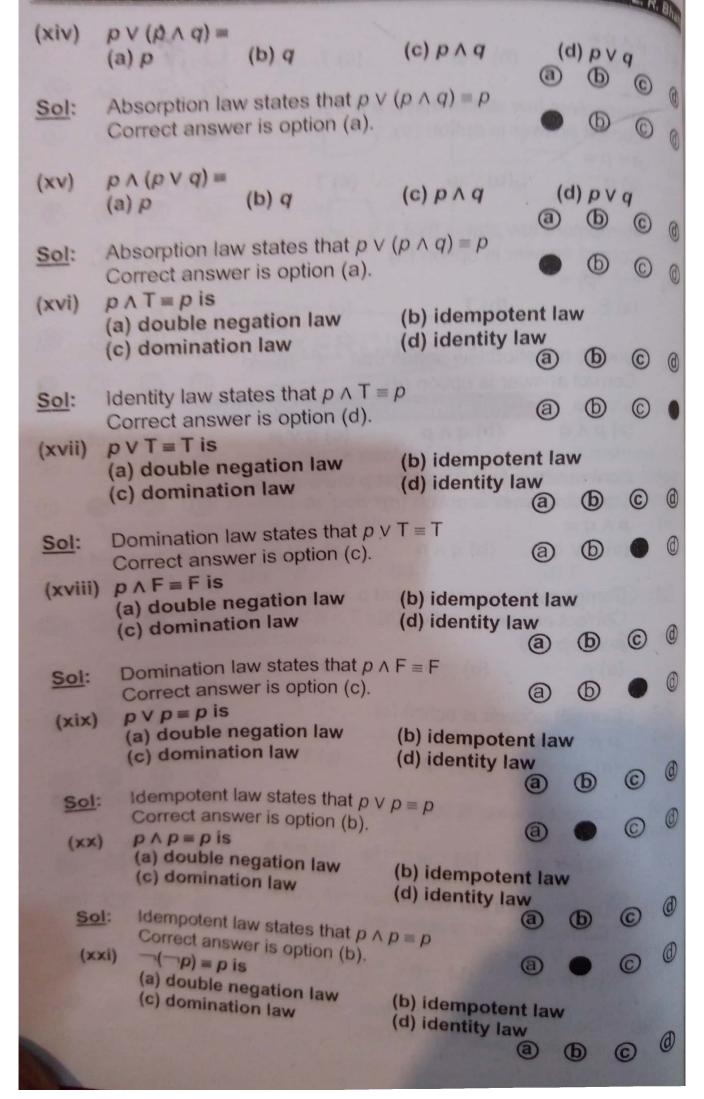
(b) ¬p

(c) T

(d) F **(D)**

Sol: Domination law states that $p \land F = F$ Correct answer is option (d).





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Sol: Double negation law states that $\neg(\neg p) \equiv p$ Correct answer is option (a).



- (b)
- 0
- (D)

- (xxii) pv¬p≡Tis
 - (a) double negation law
 - (c) domination law

- (b) idempotent law
- (d) negation law
 - a)
- **(b)**
- (C)
- **(D)**

Sol: Negation law states that $p \lor \neg p \equiv T$ Correct answer is option (d).

- (a)
- **(D)**
- (C)

- (xxiii) p∧¬p≡Fis
 - (a) double negation law
 - (c) negation law

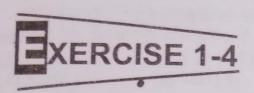
- (b) idempotent law
- (d) domination law
 - (a)
- **(b)**
- (C)
- (d)

Sol: Negation law states that $p \land \neg p \equiv F$ Correct answer is option (c).

- (a)
- 6



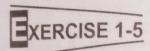




Multiple Choice Questions (MCQs)

Q.1	choice which you think is c choice. Use marker or pen two or more circles is not a	correct; fill the to fill the circ	circle	e in fr	ont of	that
/i)	In the statement "x is greate					
(i)	(a) x is predicate (c) x is subject	(b) "is greate (d) none of t		n 8" i	s sub	ject
	(C) X 13 340)000	(a) none or c	(a)	(b)	©	(1)
Sol:	In the statement "x is greater" Correct answer is option (c).	than 8", x is sub	oject.	(b)	•	(1)
(ii)	In the statement "Zeeshan i		man'	' pred	licate	is
	(a) is a handsome man (c) man	(d) handsom	_	0		
Sal	In the statement "Zasahan	h	(a)	(D)	©	(0)
Sol:	In the statement "Zeeshan"	is a handsome	e mar			
(iii)	Correct answer is option (a). If $P(x): x + 1 = 7$, then		•	(b)	©	0
	(a) $P(2): 7 = 7$	(b) $P(2): 3 =$	7			
	$(c)^{\circ}P(3):3=7$	(d) $P(4): 4 =$	7	(B)	0	a
Sol:	Correct answer is option (b).		(a) (a)	(b)	00	0
(14)	P(x): x+1=7, then which	is true?				
	(a) P(2) (b) P(3)	(c) P(4)		P(6)		
Sol:	Correct answer is option (d).		(a)	(P)	00	0
(v)	141. 4 + 1 < 5 6 6 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	in twee	(a)	(p)	(C)	9
	(a) P(1) (b) P(2)	(c) P(3)	()	DIA		
Sol:	(-)	(C) F(3)	(d)	(b)	©	(A)
her	Correct answer is option (a). If $Q(x, y) : y = x^2$.			6	0	0
	(a) 0/0 a: y - x + 2, then wh	ich is true?		0	0	W)
Sni.	(~) 4(2,0)	(c) Q(6, 2)	(d)	Q(1.	1)	
50/5	Correct answer is option (b). P(x): The word x contains	Belleville at	(a)	Q(1,	00	0
	P(x): The word x contains the (a) P(book) (b) P(school)	-1-4	(a)		0	0
	(b) P(school)	e letter a. Whi	ch is	true?		
	(30,1001)	(c) P(orange)	(u)	FICO	nege	-
			(a)	(b)	(C)	@

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Sol: (viii)	Correct answer is option (c)
	(a) $\forall x P(x)$ (b) $\exists x P(x)$ (c) $\exists ! x P(x)$ (d) none of
Sol:	Since x < 1 is true for some x. Correct answer is option (b).
(ix)	If $P(x) : x = 0$ and the domain is real numbers true?
	(a) $\forall x P(x)$ (b) $\neg \exists x P(x)$ (c) $\exists ! x P(x)$ (d) $\neg \forall x P(x)$
Sol:	Since $ x = 0$ is true only for $x = 0$. Correct answer is option (c).
(x)	If the domain of discourse consists of elements x, x, x, x, x,
	(a) $\forall x P(x) \equiv P(x_1) \land P(x_2) \land P(x_3)$ (b) $\exists x P(x) \equiv P(x_1) \land P(x_2) \land P(x_3)$ (c) $\exists ! x P(x) \equiv P(x_1) \land P(x_2) \land P(x_3)$
Sol:	(d) $\exists !x P(x) \equiv P(x_1) \lor P(x_2) \lor P(x_3)$ Correct answer is option (a). If the domain of discourse consists of elements x_1, x_2, x_3
	(a) $\forall x P(x) \equiv P(x_1) \vee P(x_2) \vee P(x_3)$
	(b) $\exists x P(x) \equiv P(x_1) \lor P(x_2) \lor P(x_3)$ (c) $\exists ! x P(x) \equiv P(x_1) \land P(x_2) \land P(x_3)$
	(d) $\exists !x P(x) \equiv P(x_1) \vee P(x_2) \vee P(x_3)$
Sol: (xii)	Correct answer is option (b).
	(a) $\forall x \neg P(x)$ (b) $\exists x \neg P(x)$ (c) $\exists x P(x)$
Sol:	Correct answer is option (a).
(xiii)	$\neg \forall x P(x)$ (a) $\forall x \neg P(x)$ (b) $\exists x \neg P(x)$ (c) $\exists x P(x)$ (d) $\forall x P(x)$
Sol: (xiv)	Correct answer is option (b). If $P(x): x > 5$, then $\neg \forall x P(x)$
(2.0)	(a) $\forall x (x \le 5)$ (b) $\forall x (x < 5)$ (c) $\exists x (x < 5)$
Sol:	Correct answer is option (d). If $P(x): x > 5$, then $\neg \exists x P(x)$ (d) $\exists x (x \le 5)$
(20)	(a) $\forall x(x \le 5)$ (b) $\forall x(x < 5)$ (c) $\exists x(x < 5)$ (d) $\exists x(x \le 5)$ (e) $\exists x(x \le 5)$ (f) $\exists x(x \le 5)$ (f) $\exists x(x \le 5)$
Sol:	$\neg \exists x P(x) = \forall x \neg P(x)$ $= \forall x (x \le 5)$ $\Rightarrow \forall x (x \le 5)$
9. 3	Correct answer is option (a).



Multiple Choice Questions (MCQs)

- Four options are given in each of the following questions, the choice which you think is correct; fill the circle in front of that choice. Use marker or pen to fill the circles. Cutting or filling two or more circles is not allowed:
- $\neg \forall x \exists y (xy = 2) \equiv$
 - (a) $\exists x \forall y (xy \neq 2)$
- (b) $\exists x \forall y (xy = 2)$
- (c) $\forall x \exists y (xy \neq 2)$
- (d) $\forall x \exists y (xy = 2)$
- (C)

- $\neg \forall x \exists y (xy = 2) \equiv \exists x \neg \exists y (xy = 2)$ $\equiv \exists x \forall y \neg (xy = 2)$
 - $\equiv \exists x \forall y (xy \neq 2)$
 - Correct answer is option (a).

(0)

- $\neg \exists x \forall y (xy = 2) \equiv$
 - (a) $\exists x \forall y (xy \neq 2)$
- (b) $\exists x \forall y (xy = 2)$
- (c) $\forall x \exists y (xy \neq 2)$
- (d) $\forall x \exists y (xy = 2)$

- $\neg \exists x \forall y (xy = 2) \equiv \forall x \neg \forall y (xy = 2)$ $\equiv \forall x \exists y \neg (xy = 2)$
 - $\equiv \forall x \exists y (xy \neq 2)$ Correct answer is option (c).
- Translate $\forall x \exists y (x < y)$ into English, where the domain for each variable consists of all real numbers is
 - (a) There is some real number which is less than every real
 - (b) Every real number is less than some real number.
 - (c) No real number is less than some real number.
- (d) No real number is greater than some real number. Every real number is less than some real number
- Translate $\exists x \forall y (x < y)$ into English, where the domain for each (a) There is some real number which is less than every real
 - (b) Every real number is less than some real number.

 - (c) No real number is less than some real number. (d) No real number is greater than some real number.
 - a b c (d)

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Chapter-1: Logic and Applications There is some real number which is less than every real number

- Correct answer is option (a). Let Q(x, y): x has sent an e-mail message to y.
- Let Q(x, y).

 Where the domain for both, x and y consists of all students in where the English of quantification $\exists x \exists y Q(x, y)$ is your class has sent an e-mail message to

some student in your class.

(b) Some student in your class has sent an e-mail message to every student in your class.

(c) Every student in your class has sent an e-mail message to every student in your class.

(d) Some student in your class has sent an e-mail message to some student in your class.

Some student in your class has sent an e-mail message to some student in your class.

Correct answer is option (d).

Let Q(x, y): x has sent an e-mail message to y. Where the domain for both x and y consists of all students in your class. The English of quantification $\forall x \exists y Q(x, y)$ is

(a) Every student in your class has sent an e-mail message to some student in your class.

(b) Some student in your class has sent an e-mail message to every student in your class.

(c) Every student in your class has sent an e-mail message to every student in your class.

(d) Some student in your class has sent an e-mail message to some student in your class.

Every student in your class has sent an e-mail message to some Sol: student in your class. Correct answer is option (a).

Let Q(x, y): x has sent an e-mail message to y. Where the domain for both x and y consists of all students in your class. The English of quantification $\exists x \forall y Q(x, y)$ is (a) Every student in your class has sent an e-mail message to

(b) Some student in your class has sent an e-mail message to

(c) Every student in your class has sent an e-mail message to

(d) Some student in your class has sent an e-mail message to some student in your class.

(a) EXYVL(x, y)

(c) EXEXE (c)

∃x∀yL(x, y): Somebody loves everybody

Correct answer is option (a).

Sol:

(d) $\forall x \forall y L(x, y)$

0

0

(C)

(D)